



US005507806A

United States Patent [19]

Blake

[11] **Patent Number:** **5,507,806**[45] **Date of Patent:** **Apr. 16, 1996**[54] **MULTI-FACETED INTRAOCULAR LENS**[75] Inventor: **Larry W. Blake**, Coto de Caza, Calif.[73] Assignee: **Pharmacia Iovision, Inc.**, Irvine, Calif.[21] Appl. No.: **242,130**[22] Filed: **May 13, 1994**[51] Int. Cl.⁶ **A61F 2/16**[52] U.S. Cl. **623/6; 606/107; 264/2.7**[58] Field of Search **623/6; 351/160 R, 351/161; 606/107; 264/2.7**[56] **References Cited****U.S. PATENT DOCUMENTS**

| | | | |
|-----------|---------|-------------------|---------|
| 2,823,417 | 2/1958 | Pasini et al. . | |
| 3,270,099 | 8/1966 | Camp . | |
| 3,339,997 | 9/1967 | Wesley . | |
| 3,440,306 | 4/1969 | Neeffe . | |
| 3,560,598 | 2/1971 | Neeffe . | |
| 3,693,301 | 9/1972 | Lemaitre . | |
| 3,866,249 | 2/1975 | Flom | 623/6 |
| 3,950,082 | 4/1976 | Volk . | |
| 4,010,496 | 3/1977 | Neeffe | 623/6 |
| 4,104,339 | 8/1978 | Fetz et al. . | |
| 4,110,848 | 9/1978 | Jensen | 623/6 |
| 4,121,885 | 10/1978 | Erickson et al. . | |
| 4,179,484 | 12/1979 | Neeffe . | |
| 4,198,714 | 4/1980 | Jensen | 623/6 |
| 4,373,218 | 2/1983 | Schachar | 623/6 |
| 4,418,991 | 12/1983 | Breger | 351/161 |
| 4,450,593 | 5/1984 | Poler | 623/16 |

(List continued on next page.)

FOREIGN PATENT DOCUMENTS

| | | |
|---------|---------|-----------|
| 2556665 | 6/1977 | Germany . |
| 2725219 | 12/1978 | Germany . |

OTHER PUBLICATIONS

Peter Hoefer, Translation of German Patent No. 25 56 665, Issued Jun. 30, 1977, pp. 1-9.

Peter Hoefer, Translation of German Patent No. 27 25 219, Issued Dec. 14, 1978, pp. 1-12.

Sean Henahan, "Early Trials Show No Blurring Of Vision

With Multifocal IOL," *Ophthalmology Times*, Aug. 15, 1988, p. 27.

Tim Donald, "Silicone Demonstrates Suitable Optic Characteristics In Resolution Testing," *Ocular Surgery News*, vol. 6, No. 16, Aug. 15, 1988, pp. 1, 16-17.

Tom Waters, "Personal Tech 3-D Comes Home," *Discover*, May 1988, pp. 30-32.

Jayne B. Morehouse, "Resolution Efficiency In Water Supported As New IOL Standard," *Ophthalmology Times*, Apr. 15, 1987, pp. 46, 48.

3M Health Care Group, "The 3M Multifocal IOL," *3M HealthCare*, pp. 1-4.

"The Shah Bifocal Universal MK II Intra Ocular Lens." Norman S. Jaffe et al., "Pseudophakos," published by the C. V. Mosby Company, 1978. Chapter 6, pp. 58-60.

"Ocular Surgery News," Jun. 1, 1987, vol. 5, No. 11, pp. 1, 14 and 15. Article No Near Corrections Needed By Almost 50 in Bifocal IOL Series.

Ocular Surgery News, Jun. 1, 1987, vol. 5, No. 11, pp. 1, 12 and 13. Article "Bifocal IOL Implanted in England; U.S. Trial May Begin This Month."

Primary Examiner—Mary Beth Jones

Attorney, Agent, or Firm—Knobbe, Martens, Olson & Bear

[57] **ABSTRACT**

An improved multi-faceted intraocular lens with a main optical element having a plurality of optical elements. The flexible, thin multi-faceted intraocular lens is made of an optical-grade soft biocompatible material, such as a flexible acrylic material, a hydrophilic material, or a silicone material. The thin, flat, multi-faceted intraocular lens may enable implantation of the lens through an intraocular lens injector having an injection tube with a diameter of approximately 1 mm to 4 mm. The plurality of optical elements each may have the same or differing diopter powers. Additionally, the plurality of optical elements may be aligned to form a multi-focal lens. Further, the optical elements each may be selected from a group consisting of toric elements, aspheric elements, and spherical elements depending upon the type of correction desired. Lastly, the multi-faceted intraocular lens may be effective in the treatment of age-related macular degeneration.

2 Claims, 13 Drawing Sheets